

WHAT IS CLAIMED IS:

1. A method for implanting ions on a surface of a substrate, the method comprising:

5        implanting ions while one of a scanning speed of an ion beam and a driving speed of the substrate changes at a center of the substrate in order to separate for two implanted regions on the substrate with different dose amounts; and

10       rotating the substrate around its center by a predetermined angle after implanting ions while the ion beam is not applied to the substrate.

2. The method for implanting ions on a surface of a substrate according to claim 1, the method further comprising:

repeating by the implanting and rotation steps.

3. The method for implanting ions on a surface of a substrate according to claim 1, wherein implanting ions is performed by reciprocatively scanning an ion beam in an X direction by an electric field or a magnetic field and by reciprocatively and mechanically driving the substrate in a Y direction, which is substantially orthogonal to the X direction.

4. The method for implanting ions on a surface of a substrate according to claim 1, wherein implanting ions is performed by reciprocatively scanning an ion beam in an X direction and a Y direction orthogonal thereto by an electric field or magnetic field.

5. An apparatus for implanting ions on a surface of a substrate, the apparatus comprising:

10 a scanning device for reciprocatively scanning an ion beam in an X direction by an electric field or a magnetic field;

a driving device for reciprocatively and mechanically driving the substrate in a Y direction, which is substantially orthogonal to the X direction;

15 a rotating device for rotating the substrate around a center of the substrate;

a control device for controlling the rotating device and one of the scanning device and the driving device;

20 wherein the control device changes one of a scanning speed of the ion beam and a driving speed of the substrate so that ion implantation is performed to separate for two implanted regions on the substrate with different dose amounts, the control device controls the rotating device to rotate the substrate around its center by a

predetermined angle after the ion implantation while the ion beam is not applied to the substrate, and the control device control to repeat the ion implantation and the rotation.

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6. An apparatus for implanting ions on a surface of a substrate, the apparatus comprising:

a scanning device for reciprocatively scanning an ion beam in an X direction and a Y direction orthogonal thereto by an electric field or a magnetic field;

a rotating device for rotating the substrate around a center of the substrate;

a control device for controlling one of the scanning device and the rotating device;

15 wherein the control device changes one of a scanning speed of the ion beam in the X direction and a scanning speed of the ion beam in the Y direction so that ion implantation is performed in order to separate for two implanted regions on the substrate with different dose  
20 amounts, the control device controls the rotating device to rotate the substrate around its center by a predetermined angle after the ion implantation while the ion beam is not applied to the substrate, and the control device control to repeat the ion implantation and the  
25 rotation.